CLAIMS

1. A double-stranded conducting polymer, said polymer selected from the group consisting of Polyaniline:Poly(vinylphosphate) double-stranded complex, Polyaniline:Poly(acrylic acid-co-vinylphosphate) complex, Polyaniline:Poly(mathacrylic acid-co-vinylphosphate) complex, Polypyrrole:Poly(vinylphosphate) double-stranded complex, Polypyrrole:Poly(acrylic acid-co-vinylphosphate) complex, Polypyrrole:Poly(vinylmathacrylic acid-co-vinylphosphate complex, Polyaniline:Poly(methylacrylate-co-vinylphosphate) complex, Polypyrrole:Poly(methylacrylate-co-vinylphosphate) complex, Polyaniline:Poly(butylacrylate-co-vinylphosphate) complex, and Polypyrrole:Poly(butylacrylate-co-vinylphosphate) complex.

2. The double-stranded conducting polymer of claim 1, wherein a first strand is a reversible electron donor or acceptor.

3. The double-stranded conducting polymer of claim 1, wherein a second strand includes the integration of appropriate ligands.

4. The double-stranded conducting polymer of claim 2, wherein the ligand is a carboxylic or phosphate functional group.

5. A composition including a conducting polymer, said composition comprising: polyaniline or polypyrrole, Poly(vinyl butyral), molybdenum oxide or cerium oxide magnesium silicate, carbon black or lamp black, n-butyl alcohol, isopropyl alcohol, and water.

6. The composition of claim 5, further comprising phosphoric acid, water, and isopropyl alcohol.

7. A composition including a conducting polymer to treat metal surfaces to provide a stable interface for adhesive binding or coating.

8. A formulation for surface treatment reagents which includes a double-stranded conductive polymer.

9. The use of water-borne double-stranded conducting polymers for as a surface conversion or surface treatment agent for metal surfaces, as a early-warning indicator for metal corrosion, as a component for a wash primer for aluminum alloys, magnesium alloys, steel and other non-noble metals, as a surface modification coating on non-metallic surfaces to catalyze deposition of decorative and functional top coatings, as an additive to improve the performance of adhesive bonding of metals, or for others that are logical extensions of the above application.